

above described problems, issues and concerns. Multiple interviews have been conducted, along with a great many consultations with individuals who work in the general field of indoor firearms range operations, specialist who work in the field of hazardous materials, air quality control technicians, Department of Administrative Services, Division of Facilities Management personnel, Department of Public Health specialist, along with a wide array of documents ascertained both in person and on the internet i.e. MSDS data, Toxicology and Biological Monitoring information, hazardous facts sheets, OSHA and NIOSHA documents etc.

### Conclusions

The visual presence of a red/brownish dust coating almost all areas of the range backstop, bullet trap, floors, and even personnel's clothing is cause for one to want to immediately determine what is in this material. The range instructors and even some of the recruits recently shooting and qualifying at the range have experienced nose bleeds, sore throats, and irritated eyes etc. along with experiencing nasal excrement's with a red/brownish color associated with same. Some range officers have even experienced a penny taste in their mouth after having worked at the range all day. The clogged bullet trap system is obviously not properly designed for the purpose for which it is currently being used for and therefore must be properly modified to match the needs of whatever type of ammunition the Division of State Police plans on utilizing for the future. The current bullet trap system is also experiencing an inordinate number of breakdowns and requiring an inordinate amount of maintenance which the current range staff are unqualified or untrained to perform. The air handling and air filtration system by all accounts has never worked as it should, or as it was expected to and therefore must also be addressed at this time.

By the mere nature and design of indoor firearms training ranges, they require a very high performance air handling system, and almost any problem which occurs at an indoor facility, is complicated when that type of system is not working properly.

### Short Term Recommendations

The Delaware State Police Firearms Training Facility should have its air quality tested ASAP.

The necessary repairs to the current bullet back stop and bullet trap system should be undertaken.

The entire range needs to be cleaned and scrubbed by certified technicians capable of dealing with the dust currently present.

Conduct blood test on each firearms training range instructor.

- Conclude all use of the range as soon as possible, so that the above described activities can be completed in full.
- Meet with representatives of Facilities Management to discuss the current problems and better yet, the future of the Range.
- Conduct immediate test on the large amount of dust present at the range and determine what this material is or contains.

#### Long Term Recommendations

The optional Spring II firearms qualification for 2004 should be canceled and the mandatory Spring I qualification normally undertaken during March and April will be moved to May and June 2004. This will provide personnel the time required to undertake the above.

Immediate stop usage of the current "non-toxic, frangible" ammunition, and undertake the R & D of a new "clean fire" round, which has no lead in the primer, so it is lead free at the shooter, and also has a bullet which stays intact upon impact with the bullet trap.

With the use of this or another comparable new bullet at the range, the bullet trap system may need to be modified.

Contract with a national consulting firm capable of assessing the status of the range facility and its air handling /bullet trap systems, and provide the Division of State Police with a comprehensive report, offering possible recommendations for rectifying the current problems, issues and concerns associated with the range.

### Chronology of Events

The Delaware State Police Firearms Training Range has been operational since the mid 1990s.

Air handling and air filtration system complaints arise and continue to the current day.

January 2001 the Division switches to "non-toxic, frangible" ammunition.

September 2003 Sgt. Ashley arranges for modifications to the current bullet trap system, due to the originally installed conveyor belt bullet retrieval system was not working with the "frangible" ammunition in use.

In December 2003, Sgt. Foraker observed several problems at the range with the air handling system and with the bullet trap system.

December 29, 2004 a technician from Mayfram Inc. arrived at the range and advised Sgt. Foraker of some problems with the bullet trap system in use at the range.

The technician observed the broken clutch, disabled limit switch, stretched chain for the conveyor, clogged filters, inoperable sprayers etc.

Lt. Davis and Sgt. Foraker along with other range staff met with Mr. Mark Devore and Mr. Doyle Tiller of the Dept. of Admin. Services regarding the problems with the air quality at the range.

January 5, 2004, Lt. Col. MacLeish asked Captain Warren to prepare a report on the concerns voiced at the range. Captain Warren advised Lt. Col. MacLeish that he had spoken to Sgt. Foraker and was awaiting written estimates for the repairs required at the range. Captain Warren advised Sgt. Foraker to check on the status of any health issues present at the range and to let Lt. Davis, Captain Warren and the Executive Staff know where we stood.

Captain Warren and Lt. Davis asked to meet with Lt. Col. MacLeish on January 8, 2004 to discuss the range concerns and other DSP training issues, however the meeting was canceled. Captain Warren advised Lt. Col. MacLeish that as soon as all test results, long term repair estimates and recommendations were obtained and compiled, he would forward to him a comprehensive report regarding all of the issues and concerns presented or raised.

Captain Warren responded to the Range on 01/20/04 to meet with the Range staff reference the multiple concerns raised at the facility. While there, Captain Warren met with a representative from Environmental Solutions who helped explain the situation present at the Range.

On 01/29/04 all Range staff were blood tested by Bay Health Medical Center for Copper and Lead levels. Results pending at this time.

On Friday 01/30/04 Captain Warren and Lt. Davis met with Lt. Col. MacLeish and Major Eckrich to discuss the problems at the range and to get approval to study the possibility of contracting a national consultant to come in and study the range and provide a comprehensive report, including recommendations on how to best correct the problems identified. Approval was requested for the expenditure required to contract with Environmental Solutions to immediately come in and test the air quality at the range during a shoot session.

On Friday, Captain Warren met with the DSP Range staff to discuss the action required of each member to facilitate correction of the problems identified. Captain Warren relayed onto the staff the following action to be taken authority the Lt. Colonel.

1. Contact Environmental Solutions to initiate the air quality testing.
2. Contact Carey's Heating and Air Conditioning (specialist in this field) to conduct a comprehensive study of the range.
3. Pilot and R &D the "clean fire" round as an alternative to the current "frangible" ammunition.
4. Identify alternative sites at which to shoot if we in fact have to shut the range down.
5. All staff and students at the range will immediately start wearing paper air mask while shooting on the Range.

Captain Warren contacted by Lt. Col. MacLeish and advised to present a report ASAP that could be used to prepare a news release from on the problems, issues and concerns at the Range.

On Friday afternoon Lt. Davis was contacted by Recruit Fountain who is a Haz-Mat specialist and was advised of the gravity of the situation up at the range and the seriousness of the health risks and recommendations for dealing with such situations.

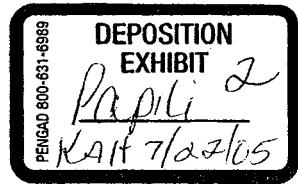
Captain Warren again recontacted Lt. Col. MacLeish with this additional information and was advised to contact supervisory personnel at DNREC Air and Waste Management regarding further advice on how to proceed. Captain Warren advised that Air & Waste Management only deals with external air quality, not indoor.

Captain Warren immediately called Megan Parker at public health asking for advice on how to proceed and was advised they could not any action without a formal request from the Department of Administrative Services.

Captain Warren immediately called Facilities Management to ask for permission to proceed and to also set up a meeting for first thing Monday morning. Elrita at Facilities advised she would call me over the weekend or Monday morning reference same.

Captain Warren received no contact from Facilities Management either over the weekend or Monday morning, and when calling in for Elrita, was advised she is off on Mondays. Captain Warren then spoke to Doyle Tiller at Facilities Management at which time he advised he had not been notified of the situation by Elrita. Captain Warren discussed the seriousness of the situation with Mr. Tiller and advised a meeting needed to be set up ASAP between representatives of Facilities Management and the State Police.

That meeting has been set up for Tuesday 2/10/04 at 1400 hrs. at the DSP Academy conference room.



October 12, 2004

The Honorable Ruth Ann Minner  
 Governor  
 State of Delaware  
 Tatnall Building, 2<sup>nd</sup> Floor  
 William Penn Street  
 Dover, DE 19901

Dear Governor Minner:

On April 21, 2004, the AOA was requested by the Office of the Governor and the Office of the Controller General to review the issues surrounding the closing of the DSP Firing Range in March 2004.

The three issues that we were requested to review and our conclusions are as listed:

**ISSUE: WHY WAS AN A/E FIRM WITH NO EXPERIENCE IN DESIGNING AN INDOOR FIRING RANGE SELECTED FOR THE PROJECT?**

- A mathematical error caused the wrong firm to be ranked number one.
- The DAS Project Manager did not want to do business with an out of state A/E firm.

**ISSUE: WHAT CAUSED THE FACILITY TO BE ENVIRONMENTALLY UNSAFE AND TO BE CLOSED IN MARCH 2004?**

We are unable to determine that any one factor resulted in the eventual closing of the range, but offer that the following were contributing causes:

- Initially, the HVAC system did not function as designed, due in part to incomplete installation requirements and interior design complications.
- Inadequate maintenance protocols i.e. the lack of written policies and procedures for routine maintenance of mechanical systems.

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- From December 2003 through March 2004 no maintenance of mechanical systems or cleaning of firing range performed.

**ISSUE: WERE ALL FUNDS APPROPRIATED FOR THE PROJECT EXPENDED FOR THEIR INTENDED PURPOSE?**

- A fire destroyed the majority of financial records therefore a detailed review could not be performed.
- A review of the State of Delaware Financial Management System's (DFMS) and DAS's Operations Management System's (OMS) data did not indicate that any appropriated funds were expended for other projects.

Shortly after the request, the Office of the Controller General provided the AOA with various documentation received from an anonymous source. In addition, the Office of the Budget provided the funding history of the DSP Firing Range.

On April 27, 2004, representatives from the AOA met with the Secretary, Department of Administrative Services (Department), and members of her administrative staff. During that meeting we were informed that:

1. All of the documentation pertinent to the DSP Firing Range had been housed in a building that was destroyed in a fire in 2000. The Department was only able to salvage a minimal amount of the documentation and that the documentation would be turned over to the AOA.
2. The Department would provide the AOA with all available computerized financial information from the Operational Management System (OMS) utilized by the Department for the recording of financial transactions.
3. The Department is responsible for the custodial, and normal building maintenance, to include the air handling system.
4. The Department is not responsible for the bullet trap system or for cleaning of the firing range area.
5. The Department purchased a HEPPA vacuum cleaner and floor cleaner for the DSP to utilize for the cleaning of the firing range.

We were also informed that an audit in 1999 of the Department's bid selection process revealed that there were errors in the mathematical scoring of some of the bid selection committees. The Department was not sure if it included the firing range selection process.

On April 26, 2004, AOA staff toured the DSP Firing Range.

On May 12, 2004 and July 28, 2004, AOA staff met with the current DSP Firing Range Training Unit at their attorney's office in Wilmington, DE. to discuss the various issues at the firing range.

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The concept of the Delaware State Police (DSP) building and maintaining its own firing range began in August 1992 when "letters of interest" were solicited from interested architecture and engineering (A/E) firms and ended in September 1998 with the completion of the facility. The firing range provided services until March 2004 when the DSP closed the facility due to environmental/health issues.

### **SCOPE/METHODOLOGY**

We obtained and reviewed all available financial records from both the Department and the DSP. Obtained and reviewed numerous types of documents from an attorney representing the current DSP Firearms Training Unit. Reviewed budgetary information provided by the Office of the Budget, and other information provided by the Office of the Controller General. Obtained and reviewed information provided by JAED Corporation and Clark Nexsen.

In addition, we interviewed the following:

1. Current and former Department of Administrative Services' personnel.
2. Current and former Delaware State Police personnel.
3. Representatives of JAED.
4. Representatives of Clark Nexsen.

Our review period included the initial August 1992 advertisement requesting "letters of interest" from Architectural firms for the design and construction management of the proposed firing range through the closing of the range in March 2004.

An integral part of a review is determining the cause of the problem and its effect on cost and operational efficiencies. During our review of the issues we were unable to determine that any one event led to the closure of the firing range. Moreover, it is our opinion that numerous decisions, which included changes to the original design specifications to inadequate maintenance protocols, were contributing factors. However, it is also our opinion that the decisions made were not with ill intent, but perhaps uninformed or lacked the professional expertise to draw reasonable conclusions for the decision making process.

Throughout our review we noted that all parties involved were operating under the premise that the project was under funded and that concessions to the original plans would have to be made in order to complete the project. This is first evidenced when the August 1995 bid proposals were rejected for being over budget and the subsequent re-bidding of the project in May 1996. Additionally, we found that decisions were made to eliminate certain aspects of the original design such as the bullet deflectors and the fire suppression system due to budgetary constraints. Also, an alternate bullet trap system was purchased due to the yearly maintenance cost associated with the originally recommended bullet trap.

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The information contained within this report is a compilation of the results of our review of available documentation and interviews with current and former interested parties.

### **REVIEW RESULTS**

#### **1. ISSUE: WHY WAS AN A/E FIRM WITH NO EXPERIENCE IN DESIGNING AN INDOOR FIRING RANGE SELECTED FOR THE PROJECT?**

##### **SELECTION/AWARD PROCESS**

In August 1992, the Delaware State Police (DSP) advertised requesting letters of interest from architectural and engineering (A/E) firms interested in the design and preparation of a master plan, specifications, bid documents and construction administration for a "fully baffled outdoor police firearms training facility". The advertisement required five (5) copies of the letters to be submitted to the Office of the Superintendent of the Delaware State Police, att: Capt. Cunningham by September 4, 1992.

On October 14, 1992, interviews were conducted of the A/E firms that had responded to the advertisement. From documents obtained from the Department it was ascertained that nine (9) firms were interviewed. Our examination of original scoring sheets filed by Karen Sweeney, P.E., DAS, revealed that the Clark Nexsen firm was ranked first and JAED was ranked seventh.

The DSP awarded Clark Nexsen a contract for a feasibility study on March 22, 1993. In December 1993, Clark Nexsen issued the completed feasibility study to the DSP. Originally, the study was to encompass a complete training facility for police officers to include an academy, firing range, skid pad, and dormitories. The study was scaled down to just the firing range due to budgetary concerns.

According to two former DSP officers involved in the process, it was their understanding that the DSP would award Clark Nexsen the contract. However, shortly before awarding the contract the DSP was informed that DAS would be involved in the project and the contract would be bid out.

In May 1994 DAS's Division of Facilities Management placed an advertisement requesting letters of interest from architectural firms for the development of plans, specifications, and construction administration of a new indoor firing range for the Department of Public Safety. In response to the request five firms, Clark Nexsen, Diamond Group, STV Group, Architects Studios and the JAED Corp., submitted letters of interest. An interview panel consisting of two DAS and three DSP employees was formed to interview the firms.

Interviews were conducted on August 15, 1994. Each member of the panel scored the firms using DAS provided scoring sheets. DAS's Project Manager collected the scoring sheets, ranked the firms based on mathematical and ordinal scoring, and announced that JAED Corp. ranked number one.

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Based on our interviews of panel members we learned that the DSP members raised questions as to how JAED Corp. could have been ranked number 1. It was their opinion that Clark Nexsen had experience in designing firing ranges whereas JAED Corp. had no experience. The DAS Project Manager informed them that the mathematical and ordinal scoring placed JAED number 1. In addition, the DAS Project Manager stated that it was the practice of the Department to give preference to Delaware firms when awarding contracts. In our interview with the Project Manager she stated that she preferred local firms because they were readily accessible during the various phases of the project opposed to out of state firms. We were further informed that as a result of the DSP panel member's objections, a stipulation of the contract would be that JAED Corp. would be required to use Clark Nexsen as a consultant on the project.

The former Chief Engineer for DAS, was interviewed regarding the process used to select firms for projects. He stated that ultimately the firm awarded the contract was the result of the selection panel's recommendation. When asked about the practice of giving in-state firms preference, he stated that the scoring sheet was set up to do so. In closing he stated that he was under the assumption that all panel members were in agreement with the choice of JAED.

#### **REVIEW OF SCORING SHEETS**

The AOA obtained from DAS the original selection panel's scoring sheets along with the DAS Project Manager's matrixes calculating the mathematical and ordinal scoring of the A/E firms.

The score sheets indicated that two panel members scored JAED Corporation first and three panel members scored Clark Nexsen first. The DAS project manager explained that the firm receiving the lower total score would be ranked first. Overall JAED Corporation received a total score of "8" based on their receiving two first place votes and three second place votes and Clark Nexsen received a total score of "9" based on their receiving three first place votes and two third place votes.

Our review showed that there was a scoring error on the Clark Nexsen score sheet completed by the DAS project manager. This error resulted in Clark Nexsen being ranked third when it should have been ranked second. If the correct score was used Clark Nexsen would have received a total score of "8" and JAED Corporation would have received a total score of "9". This would have resulted in Clark Nexsen being ranked first by the selection panel. DAS did not have a procedure for the score sheets to be reviewed to confirm that the calculation was mathematically correct and errors did not occur.

The DAS project manager was asked how she ranked JAED first even though they had no experience in designing/building firing ranges. Her reply was that JAED was a local firm and could be reached easily if needed. She did admit to saying that a stipulation would be to hire Clark Nexsen as a consultant. In a subsequent interview the DAS project manager was questioned about the bid selection process. She replied that she chose JAED because a local firm would be easier to deal with. She was then asked to explain the scoring process used. She stated that the firm receiving the lower total score would be ranked first.

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When then told of her error in the addition where-by she ranked Clark Nexsen 3<sup>rd</sup> instead of 2<sup>nd</sup> she replied it would have made no difference because the project was going to go to a Delaware firm no matter how the total came out. This was due to the philosophy in DAS that the projects would go to Delaware firms to allow the project coordinator better control and accessibility to the firm's management.

### **CONCLUSION**

We conclude that a scoring error occurred and that as a result JAED Corp. was incorrectly ranked number one. However, based on our interviews we further conclude that a Delaware firm would have been chosen regardless of the rankings.

### **2. ISSUE: WHAT CAUSED THE FACILITY TO BE ENVIRONMENTALLY UN SAFE AND TO BE CLOSED IN MARCH 2004?**

#### **HVAC**

The issue, as presented to the AOA, was that the DSP stated that JAED's HVAC system was improperly designed and therefore never worked properly. Accordingly, this resulted in numerous health issues and additional costs to the State.

During our review we conducted interviews with former and current DAS and State Police personnel, and representatives of JAED Corp. and Clark Nexsen. We reviewed test reports from environmental testing firms such as Batta Engineering and Chesapeake Testing and Balancing. In addition we reviewed Clark Nexsen's review of JAED's HVAC design.

State Police personnel and Facilities Management representatives stated that the response to complaints regarding the HVAC system and the facilities air quality were reactive rather than proactive. Procedures for the monitoring of air quality were not implemented to identify hazardous condition as they develop rather than after the condition developed. As a result, range personnel initiated numerous requests for maintenance of the HVAC system and tests of air quality.

Below we present a chronological sequence of events (not all inclusive) relating to problems identified and corrective actions taken as it relates to the HVAC system:

- March 1996, Range Tech, a prospective bidder, reviews the HVAC design and informs JAED that the system will not work.
- April 1996, the State of Delaware, Division of Industrial Affairs, sends a letter to the State Police stating "based on reviewing the full sized plans, it appears to have an adequate ventilation design for its intended purpose." Also, the letter states that "preventive maintenance" is a high priority.

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- June 1996, JAED Corp. employs Clark Nexsen to review the HVAC plans.
- In their June 7, 1996 report, Clark Nexsen addresses the following concerns with the system design:
  - The system designed allows for 75cfm airflow at the “breathing zone” not 75cfm of airflow across the entire vertical cross section (floor to ceiling), a requirement used by Clark Nexsen for indoor range design.
  - Three shooting lines have minimum airflow.
  - The HVAC system is approximately 2 1/2 times smaller than required to meet the 75cfm vertical cross section airflow.

**NOTE:** In an interview on June 6, 2004, JAED Corp. representatives informed the AOA that when they received Clark Nexsen’s June 7, 1996 report, they meet with State Police personnel and discussed the report. The State Police decided, due to budgetary constraints, to stay with JAED Corp.’s design.

In a phone conversation on July 13, 2004, the former State Police representative stated that when he was informed about the Clark Nexsen report he went to Division of Facilities Management (Facilities) and discussed both Range Tech’s and Clark Nexsen’s concerns with the current HVAC design. In addition, he stated that he requested Facilities obtain a letter from JAED Corp. indicating that the system would work as designed and if not, JAED Corp. would be responsible for repairs. In closing he stated he never received any letter from JAED Corp. to that effect and denies ever stating to JAED to stay with the original design.

It should also be noted that the following information was included in a letter dated May 18, 2004, from Savage Range Systems, Inc. stating that several years ago their Installation and Training Supervisor “noticed that there was tremendous build up of dust. He had advised the Delaware State Police that the ventilation was not designed properly for a wet system. The intake was behind the trap instead of in front of it. The air was drawing at such a high level that it was forcing the air above the trap and not allowing the trap to do its job by collecting most of the airborne lead in the water.”

- September 1998 the range opens.
- November 1998 the State Police notify JAED Corp. that the HVAC is not working properly.
- March 1999 Clark Nexsen is contracted to evaluate HVAC (\$20,000).

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- April 1999 Clark Nexsen issues report identifying changes made to their original feasibility study and recommending corrective action.
- May 1999 the following actions are taken in response to Clark Nexsen's report:
  - HEPA filters replaced to ensure adequate exhaust.
  - Automatic controls installed to monitor HEPA filters.
  - Chesapeake Testing and Balancing tests, adjusts, and balances airflow.
  - Delaware Mechanical furnishes and installs sweeps on supply duct-work (omitted by them in original installation of HVAC system) at no cost to State.
- June 1999 baffles removed from air ducts to improve airflow (\$2,600).
- July 1999 Chesapeake Testing and Balancing tests, adjusts and balances airflow (\$3,500).
- September 1999 change and disposal of lead filters (\$27,000).
- October 1999 improvements made to energy management system (\$14,500).
- February 2000 lead filters changed and disposed (7,510).
- May 2000 Batta Engineering conducts area and personal lead sampling and reported, "Based on these samples, it appears that the previous concerns have been addressed by the remedial actions that have been taken to improve the airflow through this area."
- August 2000 change and disposal of lead filters (\$7,510).
- February 2002 air duct and registers cleaned (13,756).
- December 2003 State Police contact Facilities regarding odors from cleaning fluids in repair room and concerns with air handling system.
- January 2004 Facilities and Range staff meet with Delaware Engineering and Design Company to discuss problem with odors.
- January 2004 Facilities and Range staff meet to discuss air-handling system. Facilities observe shooting session, believe that airflow is sufficient.

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- February 2004 State Police present proposal to Facilities from Carey HVAC and Action Target for \$2,500,000 to replace air handling system, bullet trap, and installing a ballistic ceiling.
- March 2004 Facilities informs State Police that they cannot support \$2,500,000 expenditure.
- March 2004 State Police inform Facilities that they are closing the range due to health concerns.

The AOA's review of the above information reveals that from May 2000 until December 2003 there were no recorded problems relative to the HVAC system. We can only surmise that the system was working properly; problems were not reported; or documentation was not made available to us to identify any problems.

#### **BULLET RECOVERY SYSTEM**

The Clark Nexsen feasibility study recommended using a "composite rubber material" system noting that "the use of rubber instead of steel alleviates the noise problem of the bullet striking the steel, stops the bullet intact without splattering into multiple pieces, reduces the maintenance required to clean the facility, and allows a weapon to be shot at point blank range from any angle without ricochet or back splatter."

The DSP decided to purchase a Savage Range Systems Inc. (Savage) Snail Trap System in lieu of the Clark Nexsen recommended system based on the Savage system would be less expensive to maintain than the "composite rubber material" system. In order to cut additional costs the DSP and Savage agreed that DSP personnel, under the direction of a Savage Technician, would assist in the installation. DSP personnel performed manual labor as well as welding tasks during the system's installation.

Savage, through July 2002, performed periodic system maintenance. It is our understanding that from that time until December 2003 the firing range Sergeant performed the maintenance required, keeping the system operational.

#### **FRANGIBLE AMMUNITION**

The Savage system is designed and built for lead rounds. In 2000, the DSP started using frangible ammunition. The decision was made anticipating eliminating lead contaminates and therefore creating a safer working environment. However, frangible ammunition was relatively new to the industry and the long term effects as related to health issues, if any, were not yet documented.